



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,904	02/04/2002	Colin Ramshaw	A01207US	7367
22920	7590	11/15/2004		
GARVEY SMITH NEHRBASS & DOODY, LLC THREE LAKEWAY CENTER 3838 NORTH CAUSEWAY BLVD., SUITE 3290 METAIRIE, LA 70002			EXAMINER BHAT, NINA NMN	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/913,904

Applicant(s)

RAMSHAW ET AL.

Examiner

N. Bhat

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8-17-2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-4-2002.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The examiner acknowledges correction of inventorship. Applicant should make sure that the inventorship is corrected in PALM, the bibliographic information in PALM does not reflect the additional inventors.

2. The disclosure is objected to because of the following informalities:  
Applicant is requested to include the heading "Brief Description of the Drawings" to Page 14, line 10. Appropriate correction is required.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porter et al. or Umetsu in combination with Cowen '133.

Porter et al. teach a reactor apparatus or centrifugal device for contacting a liquid with a gas or with a second liquid by carrying out the gas-liquid contact or liquid-liquid contact on a rotating plate whose surface is capable of creating perturbations in the

liquid flowing across it to provide intimate mixing or shear mixing to promote reaction. Specifically, if one or more plates are mounted transversely to the axis the use of one or more plates which is or are capable of creating perturbations in the film of liquid flow there over gives an improvement in mass transfer between the first liquid and second liquid or gas. The plate surface is capable of creating perturbations in the liquid flow across it and the plate can include Porter et al. protrusion from the surface, maybe corrugated, porous or perforated Porter et al. or include indentations. The plate is specifically designed to create perturbations while the liquid film flows along the spinning plate. The plate can also be a foraminate, crib form or can be gauze or mesh like and are disposed symmetrically about the axis of rotation of the rotor. The plates can be made of metal or plastic and can be made for a woven, knitted or non-woven fabric. [Note Column 1, lines 15-67 and Column 2, lines 9-50]

However, Porter et al. does not teach that the mesh or contact area is made out of or coated with a catalytic material.

Umetsu teach an apparatus for catalytic film polymerization, which includes a polymerization vessel having an interior surface defining a sidewall portion and bottom portion, means for retaining a quantity of liquid catalyst in the bottom portion wherein the catalyst (4) which comprises a film forming projecting flat section (3) having a film forming flat surface. Umetsu teaches a spinning disc thin film type reactor for making polyacetylene film, the disc is not a mesh as claimed by applicant but there is a specific teaching that the surface where the thin film reaction takes place is coated with a catalyst.

Cowen et al.'133 teach providing a spinning disc reactor, which includes providing a reactant medium, which is transported across the surface of a body rotating at high speed, discharged therefrom by centrifugal force. A chemical reaction takes place while the reactant is spinning and in contact with the spinning disc surface. Cowen et al.'133 teach that the rotating body has a coaxial surface of rotation and may be a solid body, a hollow body or shaped vessel, it can be plate shaped but more preferred is using a cup or blown shape having a flanged rim and /or substantially vertical sides so that the rotation of the body will generate a force which will operate on a liquid supplied to the surface, forces which include a centrifugal force operating radially from the axis of rotation, the rotary force will impart a stirring or shearing action on the liquid reactants.[Note Column 2, lines 32-65] Cowen et al.'133 teach that the rotating bowl or cup can include the catalyst or other promoters which can be included to the surface of the bowl or cup assembly.

It would have been obvious from the combined teachings of Porter et al., Umetsu and Cowen et al.'133 to provide a reactor apparatus using RSORT or spinning disc technology to provide a thin film reaction using the spinning disc. Both references to the rotating surface, all of the references teach imparting a shear force on the liquid which will induce mixing as well as improve residence time and by specifically using a mesh design will increase the surface area or contact time that the reactants are in contact with the surface while spinning by including perturbations such as taught in Porter et al., and using a bowl or cup shape rotating body as taught in Cowen et al.'133 The perturbations, criss-cross, woven, perforate surface or disc are all functionally equivalent

to applicant's mesh member which are all obvious design choices which are interchangeable and are specifically designed to provide a shear force or intimately mix the reactants while the reactants are spinning or subjected to centrifugal force. Porter et al. does not specifically teach that the discs are coated with or made with or impregnated with a catalyst material, this concept is taught in Umetsu. Cowen teaches that the bowl or rotatable contact plate can include catalyst as well as an other type of promoters to initiate reaction. It is maintained that the prior art does fairly teach a reactor apparatus which includes a support element rotatable about an axis, feeding means associated with the discs located in communicated with the support element, and the discs or contact surface can be made of mesh material, perforate material. The prior art teaches that using protubations on the disc, mesh, grooves etc, in order to increase the surface area for contact is known and to increase the surface area of contact is proportional to increasing the overall rate of reaction, residence time and overall efficiency of the reactor. The art teaches and artisan familiar with chemical reactor design and engineering recognizes that placing baffles, perturbations, mesh or means which will increase the surface area and will improve shear forces and initiate mixing in any type of reactor and would similarly apply in spinning disc technology, and the increase of surface area would improve the overall efficiency of the reactor from heat, mass, momentum and reaction kinetics point of view and to optimize and design the type of surface to be using a mesh type surface which provides best results and improves overall efficiency of the reactor would have been obvious to one having ordinary skill in the art at the time the invention was made.


6. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsubara et al. teach a continuous bulk polymerization reactor. Brechtelssbauer et al. teach a process for epoxidizing-substituted cyclohexanones using a spinning disc reactor. Van der Mey et al. teach a thin film reaction process using a rotating surface reactor. Matsubara et al. teach a continuous bulk polymerization reactor. Ramshaw et al. teach a rotating surface of revolution reactor with feed and collection mechanisms. Burns et al. teach a process for forming amido esters utilizing a spinning disc reactor. Nowak et al. teach a thin-film epoxidation of an unsaturated oil or alkyl fatty acid ester.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
N. Bhat  
Primary Examiner  
Art Unit 1764